

WARFIGHTER EFFECTIVENESS RESEARCH CENTER

UNITED STATES AIR FORCE ACADEMY

Biannual Newsletter

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From the Director...

The first semester of WERC execution is behind us and there's a lot on which to catch you up. In August, we rolled out an overview of our current and future vision for this center with a primary focus on supporting the warfighter. In this inaugural volume of our WERC newsletter, I'm very proud to showcase how our cadets and faculty are contributing science solutions to better ensure our national security. Our Air Force, DoD, and industry partners see the value in this vision, and are stepping forward to work with us.

In this critically important and already successful first year of execution, I want to especially thank Col Packard for his vision of this center, and LtCol Doug Lindsay for building two years of solid footing. I want to also thank the faculty and cadets in the Department of Behavioral Sciences and Leadership that are tirelessly conducting research, and our research collaborators for their dedication to this same warfighter-focused cause. Lastly, but most importantly, I'm very grateful for the all-star WERC team (see Page 6) that worked diligently this semester—there are only a few of us, but we set a pace and direction that will motivate us for many years.

Thank you for your continued support,
LtCol Chris McClernon
Director



WERC MISSION

Facilitate faculty and cadet research in the Behavioral Sciences through collaborative efforts to enhance warfighter effectiveness

WERC PRIORITIES

1. Enable the warfighter through
 - (a) Innovative cadet/faculty research
 - (b) Education/development of future leaders by applying empirical research in a unique, complex military environment
2. Facilitate faculty and cadet research
3. Create and sustain collaboration via relationship-building with DoD, industry, and university partners

WELCOME TO YOUR WERC!

Numerous visits this semester resulted in exciting new collaborations and streams of research that support the warfighter and our Behavioral Sciences curriculum

Innovation Showcase Exposes Senior Air Force Leaders to WERC Research

We participated in the first ever Innovation Showcase where Air Force senior leaders were able to talk with cadets and researchers about our ongoing research efforts. These senior leaders and policy makers were genuinely impressed with our cadet-run research topics.



Cadets Dan Thomas and Emilee Ledford describe their year-long AFSOC dismounted airman display project to Mr. William LaPlante (SAF/AQ), while Dr. Chris D'Lauro and LCDR Brian Johnson discuss their concussion research.

German Air Force To Send Psychologists

Mr. (Col) Thorsten Roth, Senior Psychologist for the German Air Force, visited to discuss future collaborations. As a result, starting in January Mrs. Michaela Schuster, a German psychologist, will reside in the WERC executing her research on remotely piloted vehicles and military stressors. We look forward to working with you Michaela! Thanks to the Academy's research office (DFER) for making this arrangement happen.

USUHS Study Investigates military identity to improve psychological well-being

Major Laurie Migliore, a Nursing doctoral student at the USUHS, performed a 30-day data collection effort in the WERC with Capt Leah Pound. Her dissertation examines the formation and properties of military identity using a self-schema framework in an active duty military population of USAFA cadets and staff. The long term goal of this research is to establish a military identity framework that can be applied to psychological well-being.



Cadets Jon Steinmetz, Dan Thomas, Alex Warner, and Courtney Bishop describe their Head-Mounted Display research to the Secretary of the Air Force, the Honorable Deborah Lee James, while Col Packard, Dr. Jim Solte, and Dr. Vic Finomore look on.



WERC International Directorate

We are very excited to launch an International Directorate within the WERC. This directorate was first established to support the German Air Force's interest in locating three German Psychologist within the WERC over an 18 month period. These visiting Psychologists have research interests that align with the WERC research streams, and some of them have even proposed teaching Behavioral Sciences courses in German to fluent cadets! The WERC is eager to reciprocate this relationship, and we are exploring international assignments opportunities for WERC researchers. We are also in the process of drafting an agreement with Dr. Deak Helton from the University of Canterbury in New Zealand. The agreement will provide a 12 month sabbatical for both Dr. Helton and a graduate student of his. This is a great opportunity to include both international researchers and graduate students in the WERC.

Meaningful Warfighter Research in an Undergraduate Curriculum

The WERC has learned a lot in the past two years about how to conduct warfighter-focused research within the constraints of an undergraduate curriculum. These two competing interests can compliment each other nicely if the correct steps are taken. The WERC team is preparing a panel on this topic with cadet and faculty panel members in addition to representatives from the joint community, industry, government labs, and program offices. While the target conference is undecided, we look forward to sharing progress on this topic with you.



Visits (continued)...

Notre Dame Researchers Continue Study on Religion at USAFA

Dr. Mary Ellen Chwedyk, Ms. Megan Rogers, and Ms. Meredith Whitnah (University of Notre Dame), visited DFBL last week to continue ongoing research in collaboration with Dr. Wil Scott (DFBL) on religion at USAFA. Their study looks at how religion at the institution reflects larger national patterns of religion and citizenship

WERC to Host Annual AFOSR Program Review

Dr. Ben Knott, Program Officer for AFOSR, visited to discuss research at the WERC and talk with the seven WERC researchers he is currently funding within his Trust and Influence research portfolio. Dr. Knott also gave a talk on AFOSR and grant writing. As a result of Dr. Knott's visit, the WERC was asked to host his annual program review at USAFA.

Joint UCF-AFRL Team Installs Research Testbed

Mr. Ben Sawyer, a doctoral student at the University of Central Florida, visited the WERC to set up a new laboratory that sup-



Mr. Ben Sawyer prepares a trial in the new ALT search and detection task.

ports the BATMAN team at AFRL as well as a research tool for his dissertation. The Attentional Layer Testbed (ALT) provides a tool to measure operator's attention allo-

cation when detecting critical events in the real world or on the see-through helmet mounted display. This tool will help evaluate the effectiveness of wearable technology systems in adequately providing information without the loss of situation awareness.

DARPA Social Simulator Arrives

Ms. Adele Luta (DARPA), Mr. Bill Ferguson and Mr. Kerry Moffitt (Raytheon BBN) installed the new Strategic Social Interaction Modules (SSIM) simulator. This is an ongoing project between DARPA, Raytheon, Princeton Laboratory, and University of California-Santa Cruz to develop an interactive social simulator. WERC was asked to participate in ongoing development and research trials using the SSIM. (See sidebar for a description of the SSIM)



Dr. Vic Finomore demonstrates 3D audio navigation to Dr. Ben Knott



The Academy's Dean, BGen Andrew Armacost, interacts with the new social simulator

Are you interested in visiting the WERC and discussing potential collaboration opportunities?

If so, please contact Capt Aaron Celaya at aaron.celaya@usafa.edu or 719-333-WERC.

http://www.darpa.mil/Our_Work/BTO/Programs/Strategic_Social_Interaction_Modules_SSIM.aspx

Strategic Social Interaction Modules (SSIM)¹

In contemporary military operations, servicemembers are called on to act as street-level diplomats, negotiators, peacekeepers, law enforcement officers and relief workers. Because their military training, however, focuses primarily on kinetic operations, many servicemembers, especially those junior in age and experience, find these roles unfamiliar and challenging. Most existing training for non-kinetic operations is limited in time and scope and typically emphasizes general familiarization with language and culture, rather than building fundamental skills that enable such specific knowledge to be implemented successfully.

The SSIM seeks to develop innovative, cost-effective methods for training warfighters in the basic human dynamics skills and proficiencies needed to enter into social encounters, regardless of the cultural, linguistic, or other contextual parameters. Rather than developing language and culture-specific knowledge, SSIM focuses on developing unique pedagogical and technological tools for enhancing the fundamental skills and proficiencies necessary for successfully managing and conducting social interaction in which participants do not share a common language, culture, or other set of defining experiences. SSIM-based training aims to enable servicemembers to approach and engage strangers in unfamiliar social environments, orient to unfamiliar patterns of behavior, recover from social errors, de-escalate conflict, integrate tact and tactics,

transition in and out of force situations, and engage in the process of discovering and adapting to previously unknown "rules of the game" intrinsic to social engagements.

SSIM research focuses on three major technical areas: the science of social interactions and human dynamics, technological and pedagogical design of training tools for developing human dynamics interaction proficiencies, and assessment of SSIM training and subsequent performance outcomes.



WERC travel: Impactful research across the DoD

Cadet and faculty researchers were busy traveling around the world to conduct and promote their research. Here's a sample of where our cadets and faculty have been this semester.

LtCol Chris McClernon, Dr. Vic Finomore, and 7 Human Factors students enrolled in Engineering Psychology visited the F-35 JSF test team at Edwards AFB, CA as part of their year-long research project on the aircraft's helmet mounted display (HMD). The team was given a tour of the F-35 including flights in the simulator, and they were familiarized with the JSF life support equipment to include the third generation HMD. Cadets briefed the test team on their research projects and were given guidance for future data collection. The trip was funded by AFOSR.

Faculty and cadet researchers investigating the impact of noisy operational environments on speech intelligibility carried out pilot data collection aboard a C-130 with the help of the 52nd Airlift Squadron.



Faculty and cadet researchers along with lead researcher from TIER 1, Dr. Terance Andre, were hosted by Mr. Jon Huss and the NORAD facility at Peterson AFB. They discussed specific research questions pertaining to the digitalization of the checklists used by the NORAD USNORTHCOM Current Operations Center.

In September, Col Packard gave a talk on the repeal of Don't Ask Don't Tell at James Madison University and the University of Mary Washington where he also taught a class on sexual intimacy and respect to Dr. Chris Kilmartin's Men and Masculinity class. He was joined by Lt Col Chris McClernon and Dr. Karin DeAngelis for research meetings within the Washington DC area including the University of Maryland, US Naval Academy, AFOSR, ARI, DARPA, the American Association of University Women (AAUW), and SAF/AQH.

Dr. George Mastroianni, US Representative to a NATO research task group representing ten countries addressing "Civilian and Military Personnel Work Culture and Relations in Defence Organisations", attended a working meeting in Berlin, Germany. Group members are administering a comprehensive survey of workplace relations and satisfaction to large samples of both military and civilian employees of their national defense establishments. The group will conclude its work in January 2016, and will issue a formal report later that year.



Concussion Research Gains National Attention

The WERC's Cognitive Neuroscience Lab – headed by Assistant Professors Chris D'Lauro, Ph.D. and LCDR Brian Johnson, Ph.D. – has taken the lead on researching concussions at USAFA. "We think that USAFA's military-academic environment and mandatory sports participation make this a unique and compelling place to study concussions," said LCDR Brian Johnson.

It was this unique military-academic status that led the NCAA and Department of Defense to include USAFA as a research site for its multi-university \$30 million Grand Alliance longitudinal concussion study. Under D'Lauro and Johnson's direction, the project got off to a running start: all Intercollegiate (IC) athletes completed cognitive baseline testing before Fall 2013 classes started.

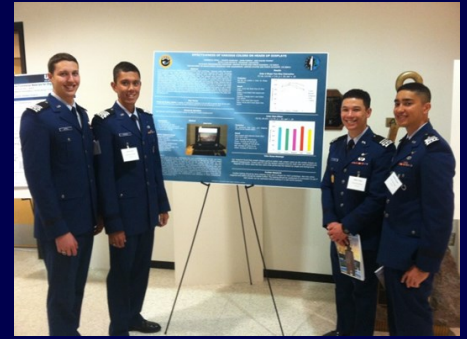
All research sites for this collaboration – including USAFA, University of Michigan, UCLA, and 12 others – agreed to administer the same tests and the same post-injury care. "Usually, each school has its own concussion protocol. By agreeing to use the same measures and treatments, we can aggregate data from all the sites to enter them into one big database," said D'Lauro.

Building from the momentum of this NCAA study, D'Lauro and Johnson directed an unprecedented effort to collect concussion baselines from the entire USAFA incoming class of 2018. "Concussion baselines provide cadets with better health information should they be concussed," said LCDR Johnson. "They also give researchers like us a more accurate picture of concussions at USAFA."



This semester's publications and presentations

- Blair, E., Finomore, V., Rahill, K., Funke, G., & Shaw, T. (2014). Best of both worlds: evaluation of multi-modal communication management suite. *Proceedings of the Human Factors and Ergonomics Society*, 58,410-414.
- Calvo, A., Finomore, V., McNitt, T., Shanklin, K., & Burnett, G. (2014). Demonstration and evaluation of an eyes-free mobile navigation system. *Proceedings of the Human Factors and Ergonomics Society*, 58, 1238-1241.
- Do, J. & Herrera, M. (2014). Secondary Adjustments and Playing it Cool: Balancing Commitment to Self and Service at the U.S. Air Force Academy. *Proceedings of the Annual Meeting of the American Sociological Association*, 109, 12-13.
- Dillard, M.B., Warm, J.S., Funke, G., J., Funke, M.E., Matthews, G., & Finomore, V.S. (2014). The sustained attention to response task (SART) does not promote mindlessness during vigilance performance. *Human Factors*, 56, 1364-1379.
- Greenlee, E., Funke, G., Warm, J., Finomore, V., Barnes, L., & Patterson, R. (2014). The effects of stereoscopic depth on vigilance task performance and cerebral hemodynamics. *Proceedings of the Human Factors and Ergonomics Society*, 58, 1731-1735.
- Holtum, B., Smith, D., Lindsay, D., & Burton, J. (2014). The relative strength of job attitudes and job embeddedness in predicting turnover in a U.S. military academy. *Military Psychology*, 26, 397-408.
- Jackson, R. J., & Lindsay, D. R. (2014). Isn't adaptive leadership just good leadership? In D. Lindsay & D. Woyscheshin (Eds.), *Adaptive Leadership in the Military Context: International Perspectives* (pp. 33-45). Ontario: Canadian Defense Academy Press.
- Kajdasz, J. (in press). Face validity of decision aids predicts decision aid reliance. *Journal of Behavioral Decision Making*.
- Lindsay D., & Woyscheshin, D. (Eds.) (2014). *Adaptive Leadership in the Military Context: International Perspectives*. Canadian Defense Academy Press.
- Mancuso, V., Christensen, J., Cowley, J., Finomore, V., Gonzalez, C., & Knott, B. (2014). Human factors in cyber warfare II: Emerging perspectives. *Proceedings of the Human Factors and Ergonomics Society*, 58,415-418.
- Mancuso, V., Finomore, V., Blair, E., & Rahill, K. (2014). Effects of cognitive biases on team decision making for cyber influence operations. *Proceedings of the Human Factors and Ergonomics Society*, 58,405-409.
- Mancuso, V., Funke, G., Strang, A., & Finomore, V. (2014). Human factors of cyber-attacks: a framework for human-centered research. *Proceedings of the Human Factors and Ergonomics Society*, 58, 437-441.
- McKinney, E., Martindale, M., DeAngelis, K., Scott, W. (2014). Presentation at the 44th Annual International Society for Exploring Teaching and Learning Conference, Denver, CO
- Satterfield, K., Shaw, T., & Finomore, V. (2014). Using cerebral hemovelocity to measure working in a complex vigilance task with display redundancy. *Proceedings of the Human Factors and Ergonomics Society*, 58,400-404
- Sawyer, B., Finomore, V., Calvo, A., & Hancock, P. (2014). Google Glass: A Driving distraction cause or cure. *Human Factors*, 56, 1307-1321.
- Sawyer, B., Finomore, V., Warm, J., Funke, G., Funke, M., & Mancuso, V. (2014). Cyber vigilance: effects of signal probability and event rate. *Proceedings of the Human Factors and Ergonomics Society*, 58, 1771-1775.
- Sellers, K. (2014, October). *Teaching Diversity and Inclusion? Actively Engage Students Emotionally to Enhance Learning*. Presentation at the 44th Annual International Society for Exploring Teaching and Learning Conference, Denver, CO.
- Stith, S., Milner, J., Fleming, M., Robichaux, R., Collins, P., Travis, W., & Robertson, K. (2014). *Screening for Risk of Future Physical Injury in Reported Cases of Intimate Partner Violence in a Military Sample*. Presented at the International Family Violence and Child Victimization Research Conference.
- Yamazaki, T. G., Packard, G. Lindsay, D., Edmondson, E., Gibb, R., Sanders, J., Schwenn, H., Walchli, S., Jones, S., Gibson, L., O'Donnell, K., & Katayama, A. D. (2014). Debunking the myths commonly believed to affect test performance among college students. *The Learning Assistance Review*, 19, 7-16.



Kudos Corner!!

McDermott Research Award:
LCDR Brian Johnson

Field Grade Officer of the Quarter:
LCDR Brian Johnson (x2)

USFA Team of the Quarter:
Dr. Karin DeAngelis, Dr. Dave McCone,
Dr. Chris Kilmartin, Capt Kara Thoreson (Sexual Assault Prevention Team)

LCDR Brian Johnson & Dr. Chris D'Lau-
ro (Concussion Research Group)

Promotion to Assistant Professor:
LtCol Wendy Travis
Maj Matthew Huibregtse

Potpourri Series

This semester we began our Potpourri series of research lectures. This is an informal, lighthearted lecture series of behavioral sciences research topics. The series began with informative lectures on how to do research and continued with authors presenting their research.

August: How to be Productive at a Pre-dominantly Teaching University
LtCol Doug Lindsay (DFBL)

September: Grant-Writing and AFOSR
Dr. Ben Knott (AFOSR)

October: DARPA and SSIM (see Page 3)
Ms. Adele Luta (DARPA)

November: Military and Civilian Personnel Collaboration within Defense Organizations — A Cross-National Study
Dr. George Mastroianni (DFBL)

Who are we collaborating with??



In the Media

Academy cadets work to improve airdrop accuracy, air-crew communication

http://www.usafa.af.mil/news/story_print.asp?id=123430726

Making an 'ImPACT': USAFA works to mitigate concussions

<http://www.usafa.af.mil/news/story.asp?id=123420140>

Academy cadets take the Immediate Post Concussion Assessment and Cognition Testing program

http://www.usafa.af.mil/news/story_print.asp?id=123430726

Blinded by science — WERC

<https://soundcloud.com/kafa-fm/blinded-by-science-werc>

Upcoming Events

January—Visit with Colorado State University (Fort Collins, CO)

January—RPA Research Visit (Creech AFB)

March—Outreach (Washington DC)

March—Southern Sociological Society Annual Meeting (New Orleans)

April—Colorado Springs Undergraduate Research Forum

May—Outreach and Int'l Symposium on Aviation Psychology (Dayton, OH)

May—Association for Psychological Science (New York)

May—Air Force Office of Scientific Research Program Review (USAFA)

The WERC Team



LCDR Brian Johnson, PhD
Deputy Director



Dr. Victor Finomore
Distinguished Visiting
Researcher



Capt Aaron Celaya
Executive Officer

INBOUND:
Ms. Michaela Schuster
Visiting Psychologist

WERC by the Numbers

Number of Researchers/Faculty: 38

Number of Students: 262

Staff: 4

Dedicated research labs: 5

Current budget: \$89k

Out for review: \$1.7M

Warfighter Effectiveness Research Center

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